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Specification

1. Title of the Invention

Fluororesin extrusion molding method

2. Scope of Patent Claims

A fluororesin extrusion molding method characterized in that, in a method for the extrusion molding of ethylene tetrafluoroethylene, at least 0.1 parts by weight of a tetrafluoroethylene oligomer with a melting point of 300°C or less are compounded with respect to 100 parts by weight of said polymer and extrusion molded.

3. Detailed description of the invention

Field of use in the industry

The present invention concerns an extrusion molding method for heteromorphic articles of ethylene tetrafluoroethylene polymer.

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[1] Translator's note: Inventor's name not confirmed. Last name can also be read "Mogi".

Previous technology

Because ethylene tetrafluoroethylene polymer has excellent flame retardant properties and a low dielectric constant, it is satisfactorily used as a coating material for electric lines and cables, particularly as a coating material for electric lines and cables for computers.

However, when this ethylene tetrafluoroethylene polymer (referred to below as ETFE polymer) is extruded into tubes and draw-down molded, it is possible to extrude it at high speeds with a good appearance, but when the profile of the molded article is heteromorphic, such as in flat shapes, melt fractures occur easily, and the extrusion molding speed has had to be reduced considerably to process it.

Problems the invention attempts to solve

The objective of the present invention is to provide an ETFE polymer extrusion molding method in which roughness of appearance, melt fractures and the like do not occur in the extrusion molded article even when ETFE polymers are heteromorphically extruded at high speeds.

Measures for solution of the problem

The present invention is characterized in that, in a method for extrusion molding ethylene tetrafluoroethylene, at least 0.1 parts by weight of a tetrafluoroethylene oligomer with a melting point of 300°C or less is compounded with respect to 100 parts by weight of said polymer and extrusion molded.

In the present invention, a tetrafluoroethylene oligomer with a melting point of 300°C or less is stipulated because with one with a melting point of 300°C or more, it does not melt sufficiently at the extrusion processing temperature of ethylene tetrafluoroethylene, giving rise somewhat to defects in appearance.

In addition, unless the amount of tetrafluoroethylene oligomer compounded is at least 0.1 parts by weight with respect to 100 parts by weight of ETFE polymer, its effectiveness in improving the appearance of the molded article is weak. The upper limit is not particularly limited, but because even when 7 parts by weight or more are compounded with respect to 100 parts by weight of ETFE polymer, no effectiveness from the increased amount is found, making it economically unprofitable, it is preferably compounded within a range from 0.1 to 7 parts by weight.

Operation

By means of the plasticizing effect of the tetrafluoroethylene oligomer compounded in the heteromorphic extrusion processing of ETFE polymer according to the present invention, roughness in appearance and the like of the extrusion molded article, from melt fractures and the like, do not occur even when extrusion processed at high speeds, making it possible to obtain good extrusion molded articles.

Working example

The compositions shown in Table 1 were extrusion coated on a conductor size 1 by 10 mm flat copper wire using a 30 mm extruder under the extrusion conditions below to investigate the maximum extrusion speed with good appearance for each composition. The results obtained are combined in Table 1.

Extrusion conditions, temperature setting of extruder:

Cylinder 280°C
Head 300°C
Die 320°C

Table 1 (parts by weight)

Composition	Working Example			Comparison Example	
	1	2	3	1	2
ETFE*	100	100	100	100	100
Tetrafluoroethylene oligomer (A)	0.1	7	10	0	–
Tetrafluoroethylene oligomer (B)	–	–	–	–	5
Maximum speed m/min	10	10	10	5	5

(Notes) * Tefzel 200 (manufactured by Mitsui DuPont Chemical Co.)

Oligomer A: TFO-V, melting point 280°C (manufactured by Central Glass Co.)

Oligomer B: Algoflon L, melting point 320°C (manufactured by Japan Montedison)

Effectiveness

As is clear from Table 1, according to the method of the present invention, ETFE polymer heteromorphically extruded articles with good appearance can be manufactured at twice the extrusion speed of previous methods (compounded without a tetrafluoroethylene oligomer), and its practical effectiveness is thus extremely good.

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